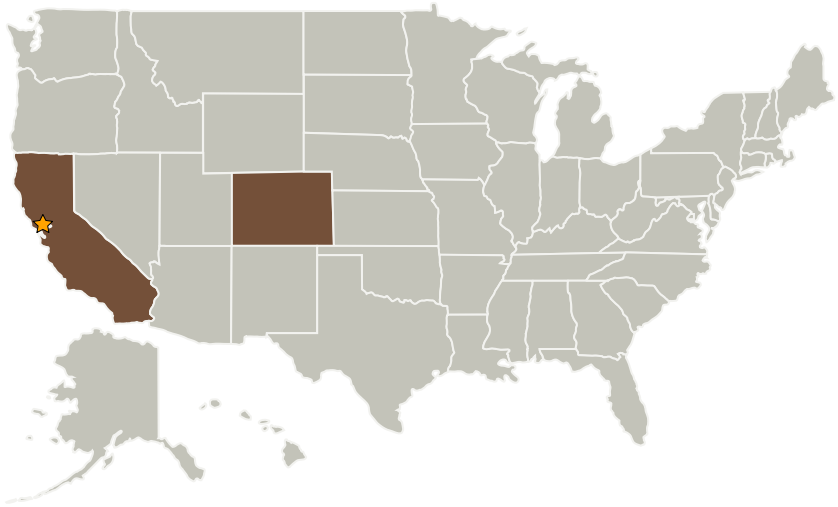
Compact Monitor for Airborne Carbon Dioxide Measurements, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

Eltron Research & Development proposes the development of a lightweight, battery-powered instrument for accurately and rapidly monitoring the local concentration of carbon dioxide (CO2) in the atmosphere. In our Phase I program, an advanced CO2 analyzer will be developed with a novel optical sensor employing a sample concentrator in conjunction with single-beam, dual-wavelength infrared measurements. The proposed monitor will utilize a thin, IR transparent film to selectively and reversibly concentrate CO2 for enhanced detection. The film's high partitioning coefficient will enable a short pathlength and low power requirements while achieving the accuracy, response time, and detection limits necessary for airborne atmospheric monitoring. Phase I of this project will accomplish evaluation of a breadboard system in the laboratory; we anticipate a TRL of 4 by the end of Phase I. By the end of the Phase II program, a prototype instrument will be built with ±0.1 ppm resolution in a background of ca. 385 ppm, <10 s response time, 800 mW power requirements, and 250 g total weight. The CO2 analyzer, which will be of reduced size and significantly more cost-effeective than the current state-of-the-art, will be suitable for use on Unmanned Aerial Vehicle and balloon platforms.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Eltron Research & Development, Inc.	Supporting Organization	Industry	Boulder, Colorado

Primary U.S. Work Locations	
California	Colorado

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic